version 2.5.3
MACINTOSH
WINDOWS

LIFE FORMS™ FOR STUDIOPRO USERS

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USING MOTION CAPTURE DATA IN YOUR STUDIOPRO MODEL

Credo Interactive, Inc.'s Life Forms® now supports Strata's new **SHM** (**S**trata **H**ierarchical **M**otion) extension, making it possible to use both StudioPro and Life Forms to make animations easier. You can animate IK structures in Life Forms, then bring them into StudioPro and add geometry, textures, etc. This document explains how to use this new feature, and includes a tutorial.

The SHM import/export extension requires StudioPro v2.5.3 or later, and works in conjunction with the IK feature in Strata's Power Module 1.

TO EXPORT SHM FILES FROM LIFE FORMS

Life Forms is a motion editing and design software *(see* **Animating in Life Forms 3** *on page 21)*. Life Forms now imports and exports the SHM file format. This file format allows you to bring motion capture and other pre-made keyframed sequences from Life Forms into Strata Studio Pro.

Life Forms can export any Life Forms animation file as a SHM file. When a model's animation is exported to a SHM file, the animation is represented by a bone figure created from the model's geometry. Because the model's geometry affects the bone setup created in the SHM file, you should carefully choose the model you use for creating motion data that for Strata Studio Pro.The geometry of the model is not exported at the present time.

Tip: Life Forms allows you to paste keyframes from one model to another. You can make use of this function to apply existing motion to simpler models before exporting SHM files.

To export SHM files from Life Forms:

1. Choose **File menu > Export**

2. Select **Strata SHM** in the Format List

3. You will see the following options in the Export dialog box:

- **Scale to Original size:**

  Check this option if you have scaled the SHM bone figure in Life Forms. Life Forms remembers the original size of the figure. Checking this option allows Life Forms to scale the motion data back to its original size.
- **Export one figure per file:**

  This option is selected by default. When this option is checked Life Forms exports only one figure per file. This option must be checked if your animation contains more than one figure.

TO OPEN SHM FILES IN LIFE FORMS

Motion data in SHM files can go both ways: into and out of Life Forms.

To import SHM files in Life Forms:

1. In Life Forms, choose **File menu > Open**.
2. In the File types menu select **Strata SHM**.
3. Browse and select the SHM file you want to open.
4. Click **Open**.

TO OPEN SHM FILES IN STUDIOPRO

Open, **Open As**: Use the Open or Open As commands in the File menu to open an **SHM** file in a new modeling window in StudioPro. This new model contains the IK hierarchy and its associated animation data only. It does not contain any geometry, textures, etc., until you create or apply them.

Import: Use this command to import motion data into an existing StudioPro model. When you import an SHM file, the software checks to see if there is already an IK structure of the same name. If not, the IK structure is imported along with the motion data. If the IK structure is already present in the model, the new motion data replaces (updates) its old animation data. **Only the animation data** is imported.

This is a very powerful feature which allows you to work in StudioPro and Life Forms simultaneously. For example, perhaps you've created and animated an IK structure in Life Forms, exported it as an SHM file, brought it into StudioPro and added geometry. Now you decide to tweak the motion of the IK slightly. You don't have to export the file out of StudioPro and back into Life Forms. Instead, just work with the original file in Life Forms, change the animation as desired, then use Life Form's **Export** command to save the file as an SHM file. Now, use StudioPro's **Import** command to import the file into StudioPro. **Only the animation information** is imported to the associated IK structure, replacing all of the previous animation data, but leaving all of the other data intact.

TO EXPORT SHM FILES OUT OF STUDIOPRO

Save As: If you've altered the animation of the Life Forms model in StudioPro, you can use the **Save As** command to save the file as an **SHM** file. All IK and animation data are saved and can be opened in Life Forms. (**Only** IK and motion data are included; no geometry, textures, etc.)

The SHM filename must contain the **.shm** suffix. (Macintosh users: If you enable the "Save with file type suffix" checkbox on the General tab of the Preferences dialog, StudioPro will do this for you automatically.)

Then, once you've finished animating the IK structure and have exported it from Life Forms as an SHM file, you can use the **Import** command in StudioPro to import **only the animation data** back into your StudioPro model. This animation data is once again assigned to the original IK structure.

TUTORIAL

This tutorial will guide you through the process of creating and animating a figure, using StudioPro and a file imported from Credo Interactive's Life Forms 3. This is an advanced tutorial designed for people who are familiar with Strata StudioPro. New StudioPro users should familiarize themselves with the basics of the application before trying this tutorial. For beginner tutorials, see StudioPro Basics in the User manual.

In the **Life Forms 3 Demo folder > Strata** folder you will find the Life Forms file you will need, as well as models of this tutorial in various stages of completion. You can create your own model, or use the models provided.

Look for the Strata icon to identify the model that includes all of the steps up to that point.

EXPORTING MOTION FROM LIFE FORMS

The first step is to export motion data from Life Forms. For this tutorial, we exported a run to a SHM file called Run.shm. The following steps describe how to do this. If you wish to skip this step you may do so.

Run.shm file stores animation exported from Life Forms. This file is in the **Life Forms 3 Demo folder> Strata** folder.

1. Choose **File menu > Browse**. This opens the File Browser.

2. In the File Browser, browse to the **Animation Gallery folder/ Run folder**. Select Run2.lfa.

3. To export the run animation, choose **File menu > Export**.

4. In the Export dialog box, select **Strata SHM** from the Export List. Do **not** select any of the export options that appear. Click OK.

5. Name the file **Run.shm** and click OK.

IMPORT IK STRUCTURE AND ITS MOTION

1. Launch StudioPro and select **New** from the File menu to open a new Modeling window.

2. Select **Import** from the File menu. Select the **Run.shm** file, located in the Life Forms 3 Demo folder / Strata folder.

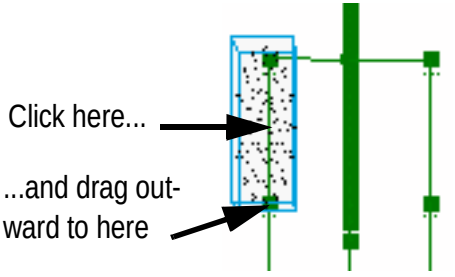
3. Select **Fit Views to All** from the Windows menu. (The Life Forms IK structure will open in meters, so it may appear extremely large.)

4. Choose **Right** from the View Orientation pop-up. This will give you a face-on view of the IK structure.

CREATE A BODY

1. Change the Display Method pop-up to **PointCloud**. The appearance of the IK structure won't change much in this display mode, but the bones won't be obscured by the geometry as you create it.

2. Select the Sphere tool on the main Tool palette. Place the cursor on the center of one of the upper arms, then hold down the **Option key** (Macintosh) or **Alt key** (Windows) and drag outward to create an oblong shape that's centered on the bone and is roughly the size of the upper arm bone.



NOTE: Using the Option key (Macintosh) or the Alt key (Windows) draws the sphere from the center. This is the easiest way to center the sphere on the bone.

3. Select the Move tool, then **Option-drag** (Macintosh) or **Alt-drag** (Windows) the same sphere to the other upper arm segment. This creates an identical copy. This is the quickest way to create matching limbs for a body.

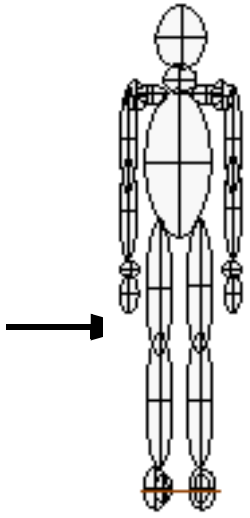
4. Repeat steps 1 and 2 to add a sphere to each arm and leg bone. Use the Zoom tool, if necessary, to adjust your view of the model.

5. Use a large sphere for the torso, and a smaller sphere for the head. Fill in the neck and shoulder areas with small spheres.

6. Switch to the **Top view** to add spheres for the feet.

7. Switch back to the **Right view** when you're through creating the body.

Your figure should look similar to this when all of the spheres have been added.



METABALL

Use the Metaball feature to smooth the figure's geometry.

1. In the Project window, hide the **IK -Actor 1** by clicking the **Hide/Show** icon next to its name.

Click the "Eye" icon to toggle between HIDE and SHOW.

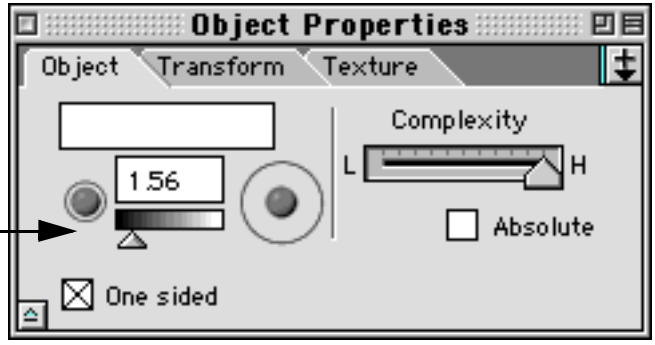
2. Change the Display method to **Shaded.**

3. Use the **Select All** command from the Edit menu to select all of the spheres.

4. Select the **Metaballs** command from the Modeling menu. All the spheres will melt together.

5. Play with the **Influence slider** on the left side of the Metaballs Object Properties palette until you're satisfied with the look of the figure.

Use the slider to adjust the influence between spheres.



NOTE: You can always use the **UnMetaballs** command, if necessary, to re-align or otherwise manipulate the individual spheres. (You may want to make the spheres that you created for the lower arms or torso narrower to prevent them from metaballing together.)

The model titled **Model1.smd** includes all of the steps up to this point. It is located in the **Life Forms 3 Demo folder> Strata** folder on the Installer CD.

SAVE THE MODEL, THEN CONVERT

Now's a good time to save the model, because once you convert it into a polygonal mesh, you can't convert it back to a Metaballs object again, and you won't have any further access to the spheres.

1. **Save** the model. Then use the **Save a Copy As** command to save a version of your model that has not been converted to poly mesh.

2. Then, select the **Convert** command in the Modeling menu.

3. From the Convert dialog, select **Polygon Mesh**, then click **OK**.

ATTACH THE POLY MESH

1. Make sure the Display Method is set to **PointCloud**.

2. In the Project window, **Show** the hidden IK structure (IK-Actor 1) by clicking the Hide / Show icon.

3. Select the **Attach tool** on the main Tool palette.

4. Hold down the **Option key** (Macintosh) or the **Alt key** (Windows), then select the IK and drag to the poly mesh. When both the IK and the mesh highlight in red, the attachment is complete. Without the **Option** / **Alt** key, only a single bone becomes attached to the entire IK structure.

   HINT: If you've successfully attached the entire IK structure to the poly mesh, the "Mesh" entry in the Project window changes to "IK Mesh". If, instead, you've acci-

dentally attached a single bone to the poly mesh, the “Mesh” entry is placed INSIDE the “IK-Actor 1” entry, and no longer appears on the main level. If this occurs, you can use the Undo command to undo the action, but only if you use it immediately after attaching. If you can’t Undo, you must use the **Detach tool** to detach the mesh from the single bone, and try again. Be sure you depress the **Option key** (Macintosh) or **Alt key** (Windows) BEFORE you select the IK structure with the Attach tool.

FINE-TUNE PROCEDURES

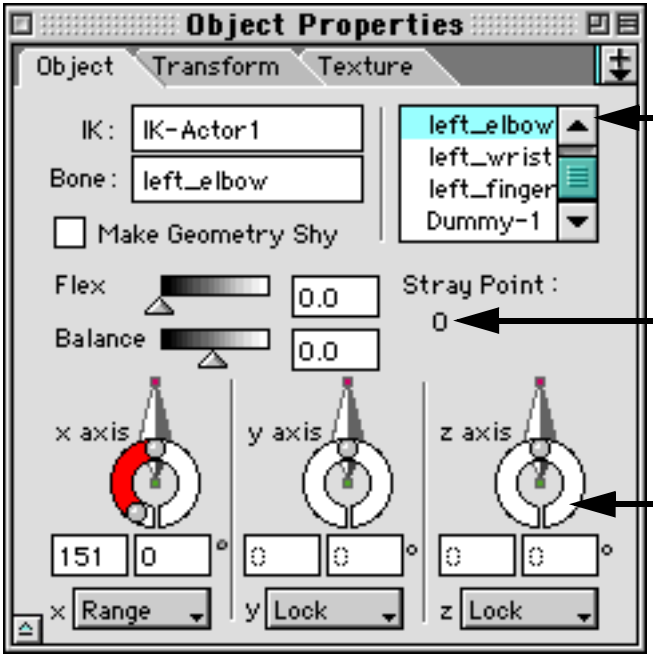
You must make sure that each piece of the poly mesh is associated to the proper bone in the IK structure. Otherwise, the geometry will tear as points try to move with the wrong bone.

This procedure tends to be the most tedious part of process, so be patient. Depending on the machine you’re using and the complexity of the IK structure, this may require a substantial amount of time to redraw the screen between tasks.

1. Select the **IK-Actor 1**. Use the **Control key** (Macintosh) or the **right mouse button** (Windows), if necessary, to prevent selecting the IK Mesh instead; or, select the **IK-Actor 1** in the Project window.

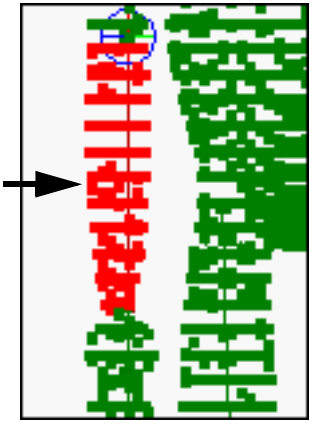
2. Select the **Reshape** command in the Modeling menu, or click the Reshape button on the Button bar.

3. Select the **Vertex tool** from the Reshape tool palette. With this tool selected, the points of geometry associated with the bone selected in the Object Properties palette appear **RED**. Points associated with other bones appear **GREEN**. Points not associated with ANY bone appear **BLUE**.



When you select a bone in this list...

...associated points appear red.



The number of points not associated with ANY bone appear in the Stray Points field. (These points appear blue.)

You won't need to change any of the rotation constraints. This information is part of the SHM file imported from Life Forms.

4. Hold down the **Command key** (Macintosh) or the **Ctrl key** (Windows), then use the Vertex tool to select all points, and the geometry they control, that you want associated with the selected bone. This modifier key ensures that all points on the depth axis are selected, as well. Without this key, you may miss some of the vertex points in the back.

5. On the Object Properties palette, change the **Flex** slider to zero to prevent the geometry from bulging as the figure is animated.

6. Select **each bone** in the list to make sure that the appropriate points are associated with it. Also, check the **Flex** setting for each bone and make sure its set to zero.

7. If there are points that aren't associated with ANY bone (stray points), those points will appear **BLUE**. Be sure to check the **Stray Point** field (directly below the scrolling list) to see if there are any unassociated points. If there are, you must locate them and assign them to a bone. If you don't, these unassociated points won't move with the figure when it's animated. Instead, they'll remain fixed in their present position.

8. Select the **End/Reshape Edit** command from the Modeling menu to exit Reshape mode.

The model titled **Model2.smd** includes all of the steps up to this point. All of the vertex points in this model are assigned to the proper bones.

APPLY A TEXTURE, AND LINK THE IK MESH TO THE BONES

Once you've finished assigning all the vertex points to bones, you'll need to link the mesh to the IK structure, so when you animate the figure, the geometry moves with the bones. But first, select a texture and apply it to the mesh.

1. Select the **IK Mesh** in the Modeling window.

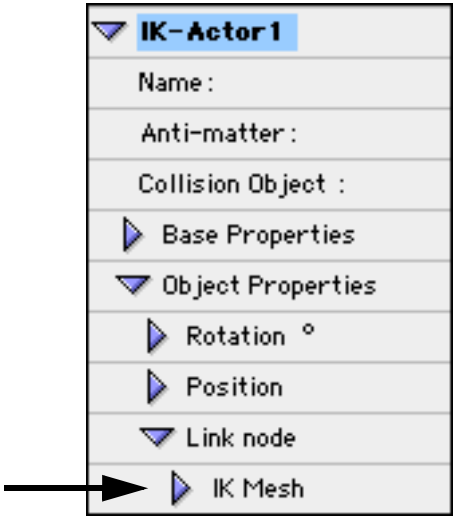
2. Select a texture from the Textures tab of the Resource palette, then click the **Apply** button to apply the texture to the mesh. (The texture on our model is Metal Pattern 1. It's located in the Stone's Throw™ folder.)

3. Select the **Link tool**.

4. Select the mesh first, then drag to select the IK.

   Both the mesh and the IK structure highlight to indicate the link is complete.

   NOTE: Once properly linked, the **IK Mesh** entry no longer appears in the top level of the Project window. Instead, it disappears into a Link node inside the **IK-Actor 1**'s Object Properties.

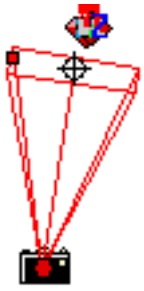


GET READY TO RENDER

1. On the Ground tab of the Environment palette, check the **Ground Plane** box, then select a texture. (We used the "Old Copper" texture, located in the Direct Imagination™ folder.)

   NOTE: You may want to use a large flattened cube instead of a ground plane to reduce the amount of time required for rendering.

2. Select **Top** from the View Orientation pop-up.
3. Select the **Camera tool**, then insert a camera beside (below) the figure. You many need to zoom out to place the camera far enough from the figure to keep it in the camera's view at all times.



Top view

If the camera's Look At point isn't visible, grab and drag the camera slightly until you can see the red outline that shows where the camera is pointing.

4. With the Object Move tool, grab the **Look At** point and drag it CLOSE TO, but not ON, the figure.

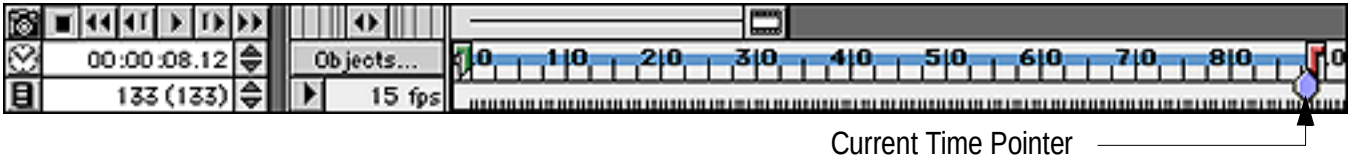
   - OR -

   Grab the **Look At point** with the Object Move tool, then hold down the **Option key** (Macintosh) or the **Alt key** (Windows) and drag to the figure. The figure highlights in green to indicate that the camera is aimed at it, but not locked onto it.

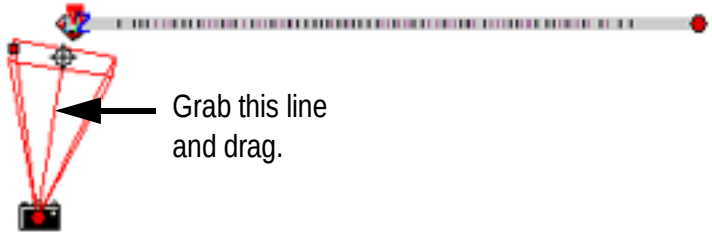
5. Switch to the **Front view**, then grab the camera and raise it so it's approximately at waist level on the figure.
6. Select **Camera-1** from the **Windows>Camera Windows** pop-up to open the Camera window. You can make any last minute adjustments in this window.

7. With the **Option key** (Macintosh) or the **Alt key** (Windows) depressed, select **Fit Views to All** from the Windows menu. Using the Option / Alt key also includes the animation path to fit in the view.

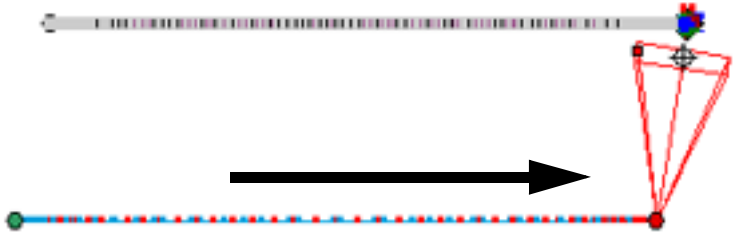
8. Move the **Current Time pointer** to the Cut-Out point.



9. With both the figure and the Camera selected, **grab the line** that runs between the camera and the camera's Look At point and drag to the end of the figure's animation path. (If the figure is not also selected, you won't be able to see it's animation path, so it's important that both are selected.)



NOTE: By grabbing the line between the camera and its Look At point, BOTH the camera AND the Look At point move together.



The model titled **Model3.smd** includes all of the steps up to this point. Everything is all set to begin the rendering.

RENDER THE ANIMATION

1. Double-click on the camera icon in the Modeling window to open its Camera window, or select **Camera-1** from the **Windows>Camera Windows** pop-up.

2. Select the **Render** command from the Rendering menu.

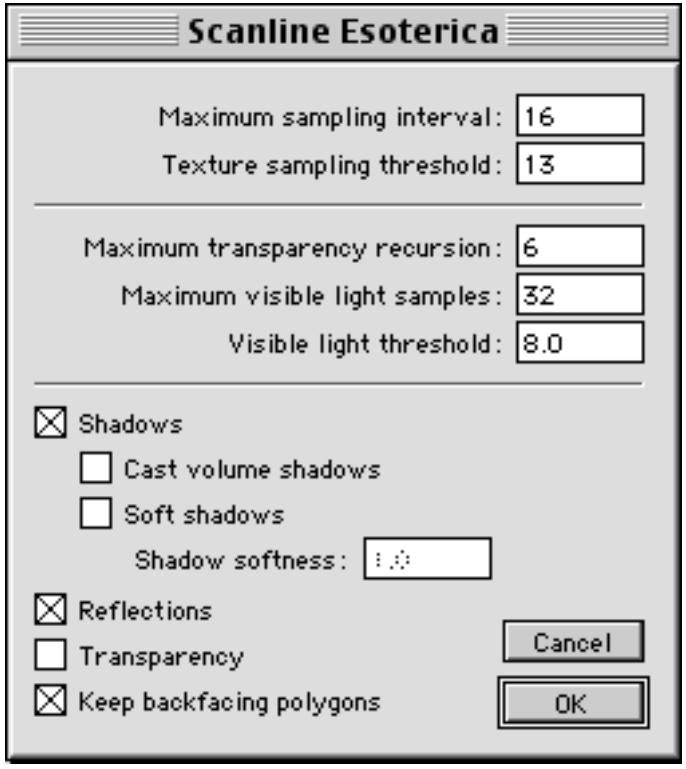
3. Select **Scanline-Good** from the Renderer pop-up.

4. Click the **Expert** button to display the Scanline Esoterica dialog.

5. Check the **Shadows** checkbox to enable shadows, then click **OK** to close the dialog.

6. In the Render dialog, click the **All** button to render all of the frames in the animation.

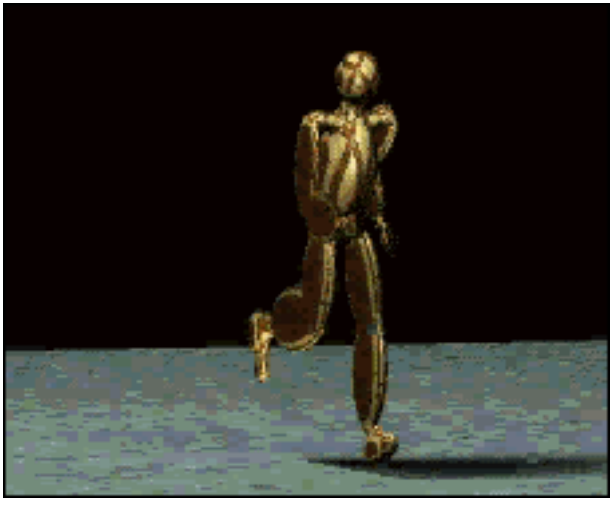
7. Click **Render**, then name the file and select a compression format from the dialogs that follow.



When all of the frames complete rendering, the animation opens in a playback window. Click the **Play** button to view the animation.

– OR –

You can view our pre-rendered animation by opening the **CredoStrataMan.mov** in the **Life Forms 3 Demo folder>Strata** folder on the Installer CD.



ANIMATING IN LIFE FORMS 3

Life Forms has a simplified yet highly effective interface for animating segmented characters and bones. This interface is ideal for creating keyframed animation as well as for editing motion capture data. Seasoned 3D Artists that are getting into the character animation business as well as professional animators will find Life Forms useful for quickly adding motion to their projects and for working with motion captured data sets. Here are a few reasons why we think so.

A KEYFRAMER

Life Forms is a specialist in Keyframing. When you want to create custom animations from scratch, Life Forms is the tool to use. It has:

- a **Figure Editor** for fast and accurate positioning of joints;
- simple controls for adjusting location and facing angle of the figure in the **Stage window**;
- **graphical Timeline** that gives you the ability navigate through the animation, and expand or contract selected frames.

Life Forms allows you to explore, exercise, and expand your character animation skills.

A LIBRARY OF MOTIONS

Life Forms Studio 3 comes with a library of models and motions called PowerMoves. This library contains 120 motion captured sequences, and over 600 other sequences that you can reuse as is, recombine, or modify. The non-Studio version of Life Forms does not include the PowerMoves 1&II Library but still provides a starter set of motions and models.

SMART PASTE FUNCTIONS

Life Form's Smart Paste functions make it unique. These functions save you a lot of trouble by enabling you to:

- **assemble** a longer animation from short pre-made sequences. When you paste one animation in front of, after, or in the middle of another animation Life Forms automatically recalculates the location values to produce a continuous path.
- **reuse** predefined animation. Life Forms enables you to paste motion sequences from one model to another. The **Joint Map editor** lets you control how motion data is applied from the a source to a destination model.
- **blend** the actions of various body joints by pasting motion of selected body parts from one animation to another.

MOTION EDITOR

Life Forms takes the guess work out of motion editing by providing easy to understand ways for you to make adjustments to your animation. This is why Life Forms is increasing used for projects which have large animation component. Game character animation and crowd scenes are just a few examples.

- **Editing a Range of frames**: The Range edit feature enables you to apply a relative or absolute rotation to one or more joints over a range of frames. For example, you have sequence that is perfect for your needs except that the head should be looking down instead of forward. In Life Forms, this is simple matter to fix. Simply select all frames and apply an absolute or relative rotation to the head so that it faces the desired position.
- **Editing the Path**: Life Forms has simple and effective controls for rotating and translating a path.
- **Adjusting the timing**: You can quickly change the duration of the animation by expanding or compressing a range of frames.